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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,201	06/26/2001	Paul Lecoq	K316.105.101	9332

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EXAMINER

GAGLIARDI, ALBERT J.

ART UNIT PAPER NUMBER

2878

DATE MAILED: 04/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/892,201		LECOQ, PAUL	
	Examiner		Art Unit	
	Albert J. Gagliardi		2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 and 35-40 is/are pending in the application.
- 4a) Of the above claim(s) 5-7 and 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-15, 19-26 and 35-40 is/are rejected.
- 7) ☐ Claim(s) 27-34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152). |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I B in Paper No. 9 is acknowledged. The traversal is on the ground(s) that since original evidence claim 31 is now cancelled, there is no longer a basis for the restriction.

Regarding the cancellation of evidence claim 31, the examiner notes cancellation of such claim is not sufficient, in and of itself, to overcome the restriction requirement required in the office action mailed 10 December 2002. The examiner notes that once an evidence claim is found in an application that indicates a combination does not rely on the specific details of a subcombination, and a proper restriction is subsequently made, rejoinder of any restricted claims would be proper only when the evidence claim is subsequently found to be unallowable (see MPEP 806.05(c)III). In the present case, there is no indication that the Group III invention (i.e., the invention of the evidence claim) is not allowable. As such the restriction between the Group I and Group III inventions is maintained.

Regarding the claims of Group II, the examiner notes that the specification discloses that multiple layer detectors including a determining means using pulse shape detection are known in the art, such disclosure amounting to an admission that the claims are unallowable. As such, the claims of Group II have been rejoined.

Regarding the claims of Group IV (i.e., claims 27-30), the examiner notes that such claims have been objected to on the basis of informalities and are not being considered on the merits, but that in view of the below rejection, the examiner now considers that there is no

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patentable distinction between the claims of Group I and Group IV and/or extra effort required in the search, and therefore, the restriction between such groups has been withdrawn.

Regarding the restriction between species, the examiner now considers that there is no patentable distinction between the recited species and the restriction between species has been withdrawn. If applicant considers that there is a patentable distinction between the recited species, the restriction may be reinstated.

Since the restriction between Group I and Group III is considered valid, claims 5-7 and 16-18 have been withdrawn from consideration as being directed to a non-elected invention.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Objections

3. Claims 27-30 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding dependent claims 27 and 29, the base claims (1 and 12, respectively) already require that the scintillator comprises LuAP and LuYAP, respectively.

Regarding dependent claims 28 and 30, the base claims (1 and 12, respectively) require that the scintillator comprises LuAP and LuYAP, respectively. As such, these claims suggest an alternate arrangement and not a more limiting arrangement. Note: the examiner does not consider the claims as suggesting a scintillator comprising two different materials, wherein the two materials are LuAP and LuYAP since there is no established antecedent basis in the chain of dependency for two different scintillators.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 8-9, 23-24, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson et al. (US 6,040,580) in view of Cherry *et al.* (US 6,552,348 B2) and Pi *et al.* (US 6,194,726 B1).

Regarding claim 1, *Watson* discloses (Figs. 1, 2, and 11) a positron emission tomography camera or scanner comprising a patient area (23 generally) a detector ring (22) including a plurality of scintillation detectors and a converting means optically coupled to the scintillation detectors (see generally Fig. 11, ref. 20).

Although *Watson* does not specifically disclose the scintillation detector material, *Cherry* (col. 3, lines 31-35) suggests that the detectors are discrete LSO based scintillators).

Regarding the use of a LuAP type material, *Cherry* discloses that a wide variety of other types of known scintillating material such as GSO, BGO, LGSO YAP and NaI(Tl) are known as

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suitable for use in gamma detectors. *Pi* further discloses a more comprehensive list of known functionally equivalent scintillation materials known for use in gamma detectors including LuAP (see col. 12, lines 39-55). Therefore, absent some degree of criticality, it would have been obvious to a person of ordinary skill in the art to modify the device suggested by *Watson* so as to utilize scintillation detectors comprising any of the known functionally equivalent materials such as LuAP.

Regarding claims 2-4, the use of multiple layers of scintillating crystals and a pulse shape determining means are well known in the art (see specification at page 4) and therefore it would have been obvious to a person of ordinary skill in the art to modify the device as suggested according to claim 1 above to further include a second scintillating layer and a pulse shape determining means so as to allow for a system with high stopping power and high resolution.

Regarding claims 8 and 9, although *Watson* does not specifically disclose the type of converting means used, *Cherry* teaches that it is known in the art to utilize position sensitive photomultiplier tubes (col. 3, lines 9-15) in order to produce high resolution, high sensitivity images.

Regarding claim 23, the device suggested by *Watson*, *Cherry*, and *Pi* as applied to claim 1 above, suggests a positron emission camera including $\text{LuAlO}_3\text{:Ce}$ (LuAP) scintillators.

Regarding claim 24, multiple layers of scintillating material including the use of LSO are known in the art and would have been an obvious design choice (see explanation regarding claim 2 above).

Regarding claim 35, multiple layers of scintillating material including the use of LSO are known in the art and would have been an obvious design choice (see explanation regarding claim 2 above).

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6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Watson, Cherry*, and *Pi* as applied above, and further in view of DiFilippo (US 6,078,052).

Regarding claims 10-11, *DiFilippo* discloses that the use of avalanche photodiodes instead of photomultiplier tubes is well known and considered as a functionally equivalent design choice depending on the needs of the application (col. 5, lines 34-38). Silicon-type diodes are well known and would have been an obvious design choice.

7. Claims 12, 19-20, 25-26, 36, and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Watson, Cherry*, and *Pi* as applied above, and further in view of Mares (Spectroscopy and characterisation of Ce^{3+} -doped pure or mixed $\text{Lu}_x(\text{RE})_{3-x}\text{AlO}_3$ scintillators).

Regarding claim 12, the device recited according to claim 12 is suggested by the device suggested by *Watson, Cherry*, and *Pi* as applied to claim 1 above except for the use of LuYAP instead of LuAP. Regarding the use of use of LuYAP, *Mares* discloses that mixed scintillators comprising LuYAP show more promise for use in scintillation application than pure materials such as YAP or LuAP (Abstract). Therefore, absent some degree of criticality, it would have been obvious to a person of ordinary skill in the art modify the device suggested by *Watson, Cherry*, and *Pi* as applied above so as to utilize LuYAP as suggested by *Mares* in view of the known suitability of such material for such applications.

Regarding claims 13-15, the use of multiple layers of scintillating crystals and a pulse shape determining means are well known in the art (see specification at page 4) and therefore it would have been obvious to a person of ordinary skill in the art to modify the device as suggested according to claim 12 above to further include a second scintillating layer and a pulse

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shape determining means so as to allow for a system with high stopping power and high resolution.

Regarding claims 19-20, *Cherry* (see explanation regarding claims 8-9 above) suggests the use of position sensitive photomultiplier tubes.

Regarding claim 25, the device suggested by *Watson, Cherry, Pi, and Mares* as applied to claim 12 above suggests a positron emission camera including $\text{LuYAlO}_3\text{:Ce}$ (LuYAP) scintillators.

Regarding claim 26, multiple layers of scintillating material including the use of LSO are known in the art and would have been an obvious design choice (see explanation regarding claim 2 above).

Regarding claim 36, multiple layers of scintillating material including the use of LSO are known in the art and would have been an obvious design choice (see explanation regarding claim 2 above).

Regarding claim 37, the device suggested by *Watson, Cherry, Pi, and Mares* as applied to claim 12 above suggests a positron emission camera including scintillators comprising one of LuYAP or LuAP scintillators.

Regarding claim 38, *Cherry* (see explanation regarding claim 8 above) suggests the use of position sensitive photomultiplier tubes.

Regarding claim 40, multiple layers of scintillating material are known in the art and would have been an obvious design choice (see explanation regarding claim 2 above).

8. Claims 21-22, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Watson, Cherry, Pi, and Mares* as applied above, and further in view of *DiFilippo*.

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Regarding claims 21-22, *DiFilippo* (see explanation regarding claims 10-11) suggests the use of silicon-type avalanche photodiodes.

Regarding claim 39, *DiFilippo* (see explanation regarding claim 10) suggests the use of avalanche photodiodes.

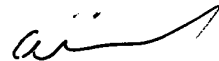
Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert J. Gagliardi whose telephone number is (703) 305-0417. The examiner can normally be reached on Monday thru Friday from 9 AM to 5 PM.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Albert J. Gagliardi
Examiner
Art Unit 2878

AJG
April 28, 2003